A PHOTOGRAPHIC GUIDE TO SOME FRESHWATER OLIGOCHAETA FOUND IN CANTERBURY STREAMS

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ABSTRACT

A photographic guide to some of the more common Oligochaeta of New Zealand streams is given.

INTRODUCTION

In New Zealand, it is difficult to obtain positive identification of even the most common species of freshwater Oligochaeta. Because of this I felt that photographs of the diagnostic features of the more common species would bridge the gap between illustrations used in written keys and what a novice observes down a microscope.

The collections of Dr V.M. Stout of the University of Canterbury, which had been identified by Dr R.O. Brinkhurst, of the Fisheries Research Board of Canada, and a small collection named by Dr M. Ladle of the Freshwater Biological Association, U.K. and presented to the author, provided positively identified species. Photomicrographs were taken of these species and arranged in the same order as Brinkhurst's 1971 key to the Australasian Oligochaeta. It is my intention that the photographs should assist in the interpretation of Brinkhurst's written key and not be regarded as a key by themselves. Once confidence in the identification of the more common species has been obtained, the sometimes-subtle differences between less common species should become apparent.

Because oligochaetes are important in benthic ecosystems, it is imperative that workers on freshwater benthos become familiar with them. It is hoped that this publication will assist beginners with initial identification and allow them to progress to the more comprehensive traditional keys.

NOTES ON METHODS USED FOR EXAMINING WORMS

A method used successfully to narcotise oligochaetes was to bubble carbon dioxide into water containing the worms. Preservatives commonly used were 10% formalin, or 70% ethanol. If alcohol is used, the solution should be isotonic, or the worms may "explode".

Lactophenyl polyvinyl acetate (LPVA) was used to mount and clear specimens. The addition of lignin pink to LPVA facilitates location of cleared worms on the slide.

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GUIDE TO SPECIES

LUMBRICULIDAE

Lumbriculus variegatus has bifid chaetae, with the upper tooth much finer than the lower (Fig. 1). Sexually mature forms are rare, though regenerating segments (Fig. 2) are common.

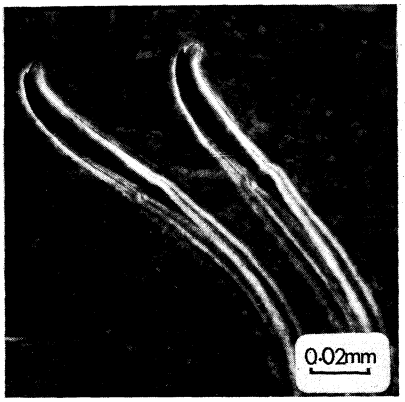

FIGURE 1. *Lumbriculus variegatus* with upper tooth finer and reduced

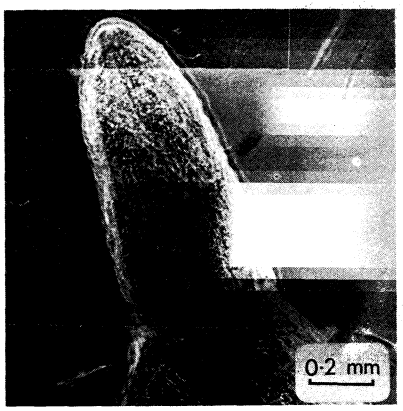

FIGURE 2. *Lumbriculus variegatus* showing posterior segments regenerating

Stylodrilus heringianus has stout, bifid chaetae, with the upper tooth reduced or absent (Fig. 3). Sexual forms frequently possess paired elongate penes on the tenth segment (Fig. 4). This species is not commonly found in polluted water.

FIGURE 3. *Stylodrilus heringianus* showing stout chaetae with reduced upper teeth

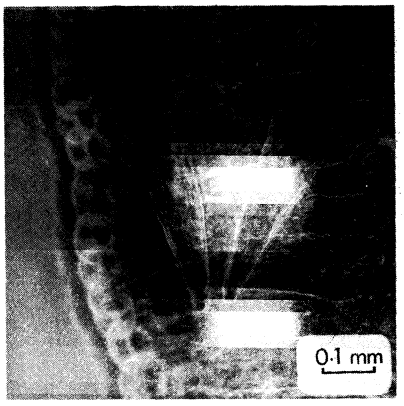

FIGURE 4. *Stylodrilus heringianus* showing mature elongated penes

PHREODRILIDAE

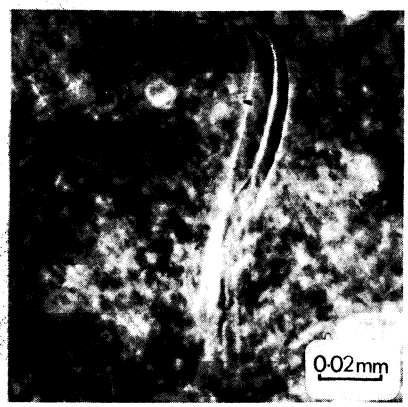

FIGURE 5. *Phreodrilus mauienensis* is easily identified because the ventral chaetal bundles have one bifid and one single pointed chaeta

NAIDIDAE

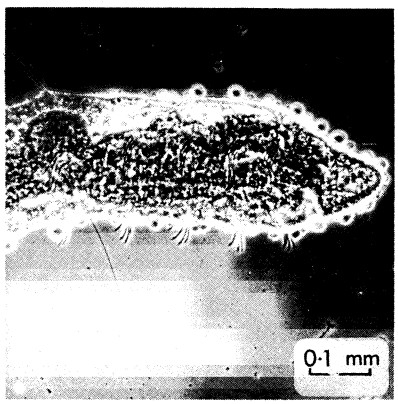

FIGURE 6. Low power anterior view of *Slavina appendiculata* showing the location of long dorsal chaetae on the 6th segment

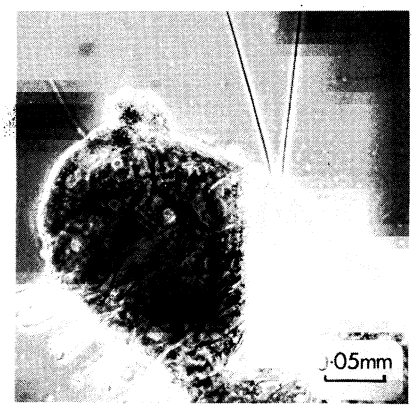

FIGURE 7. *Slavina appendiculata* showing the different size of the dorsal and ventral chaetae and foreign matter which is typically found adhering to the body surface

The genus *Nais* is characterised by needles with fine teeth, which may be stout and equal, or long, parallel and equal.

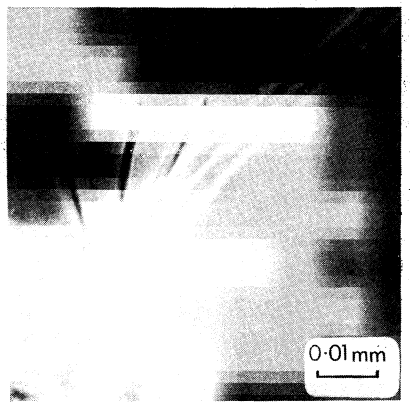

FIGURE 8. *Nais elinguis* has dorsal chaetae with bifid teeth long, fine and parallel

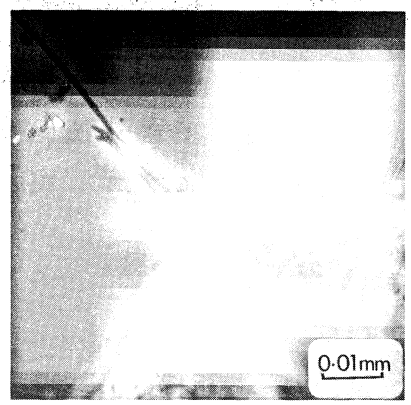

FIGURE 9. Short, diverging needle teeth are typical of *Nais variabilis* and/or *N. communis*

TUBIFICIDAE

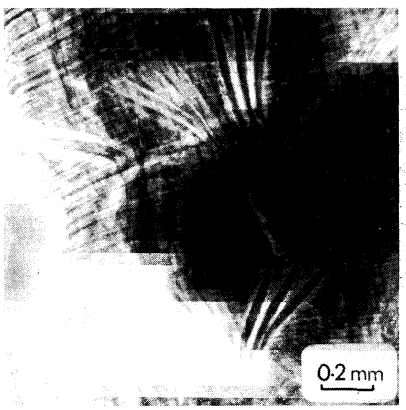

FIGURE 10. *Telmatodrilus multiprostatus* is a tubificid with all chaetae simple pointed. There are always more than 2 chaetae per bundle

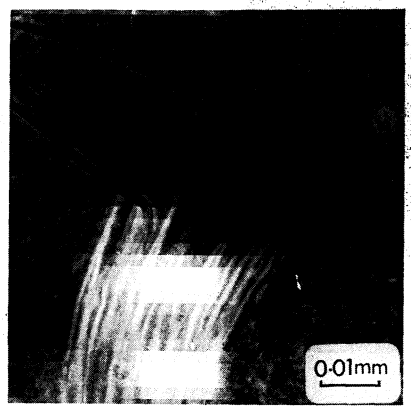

FIGURE 11. Numerous fine chaetae with upper tooth of bifid chaetae much shorter and thinner is characteristic of *Aulodrilus pluriseta*

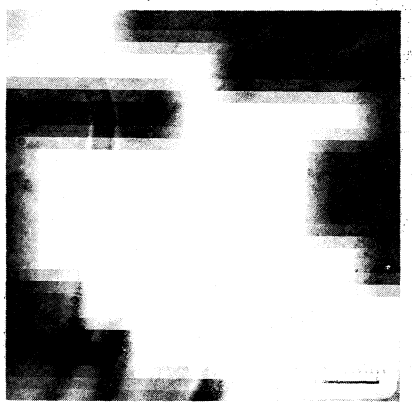

FIGURE 12. *Tubifex tubifex*, which has well developed pectinate bifid chaetae in the dorsal bundle (Fig. 12), is one of the most common inhabitants of polluted waters. *Potamothrix bavaricus* often occurs with *T. tubifex* and can only be distinguished from it when mature when it developes a specialised pair of spermathecal chaetae (Figs. 13 and 14) which *T. tubifex* does not possess.

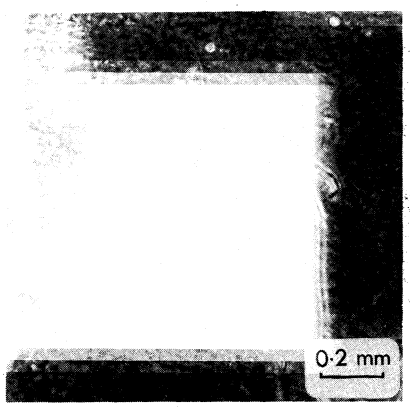

FIGURE 13. Relative size and arrangement of spermathecal chaetae of *Potamothrix bavaricus*

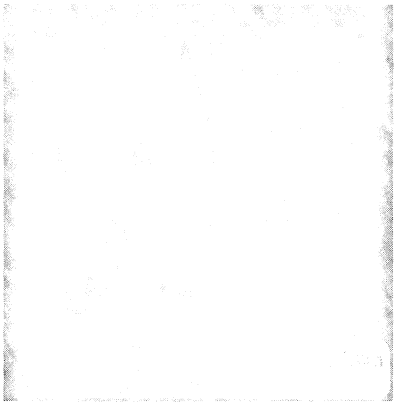

FIGURE 14. Spermathecal chaetae of *Potamothrix bavaricus*

The arrangement of the chaetal bundle (Fig. 15) is characteristic of *Limnodrilus*. Figure 15 is of *Limnodrilus hoffmeisteri* and the shape of the individual chaetae can be seen. The penis sheath is best used for accurate species determinations in this genus. *L. hoffmeisteri* is often as common as *T. tubifex* in polluted waters.

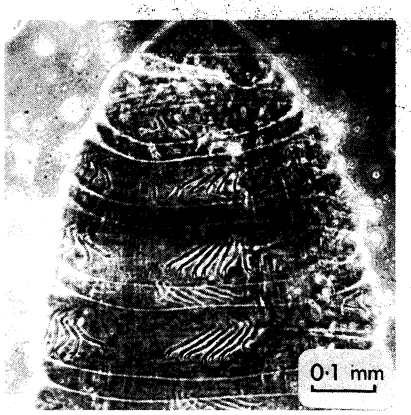

FIGURE 15. Anterior end of *Limnodrilus hoffmeisteri*

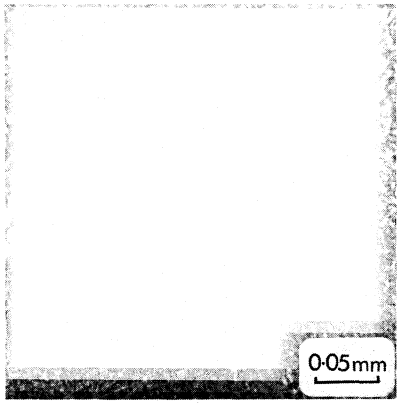

FIGURE 16. *Limnodrilus hoffmeisteri* showing penis sheaths.

Limnodrilus udekemianus is a less common oligochaete but is easily differentiated from other species of *Limnodrilus* by the heavier and longer upper tooth of the chaetae and the very short, broad penis sheaths.

ACKNOWLEDGMENTS

The production of this illustrated key was stimulated by Dr R.O. Brinkhurst's studies on freshwater oligochaetes and his very useful keys. I wish to thank Drs V.M. Stout and M. Ladle for identified material, and

Dr M.J. Winterbourn for his helpful comments and enthusiasm during the course of my studies on the freshwater oligochaetes. Mrs J. Buckley kindly printed the plates and Mr F. McGregor gave access to photomicrography facilities.

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